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shop from which an outsider can form a better judgment of the general management than by an observation of the tool-room. The best economy is established by securing none but the best tools at the outset, for in the long run they will be found the cheapest. As a rule, it is expensive trying experiments by purchasing tools of new and untried patterns or material. New machines and tools are often constructed so as to leave no reasonable doubt of their successful operation, but this is not invariably the case. It is always safe to buy those about the working of which there is no doubt. Second-hand machinery can often be obtained in good order at very low prices, if the purchaser has extra time at his disposal to look it up, but when machinery is much worn, its value is questionable at any price. It is not only easier, but a greater satisfaction, to take care of good tools than of poor ones.

Making Wooden Pulleys.

A PULLEY over twenty-four inches in diameter should be built on a spider; all under that size can be made on a wood centrepiece about two inches thick, having a cast-iron flange, say eight inches in diameter for a twenty-inch pulley, with a hub and boss about three inches long. Four bolt holes should be made through the flange for bolting to wood centre. The latter should be a nice fit on the shaft, with key seat the same as for an iron pulley. After preparing the centerpiece by planing smooth and straight, make a templet, the length being about one sixth or one eighth of the diameter and two inches wide. By this mark out the amount of stuff for the required width of the face. The lumber should be about seven eighths or an inch thick, sawed out to the same circle as centerpiece. Plane straight and smooth, and make the butt joints a perfect fit; glue and nail on. If a flange is desired on each edge to keep the belt from running off, make the outside layer a little wider and allow it to lap over the face. Put the pulley into a lathe and turn it up. Thus made, it will be durable and will not easily break.—*B. J. Donaway in Scientific American.*

The Proper Speed for Circular Saws.

THE *Lumberman's Gazette* says: "Nine thousand feet per minute—that is nearly two miles per minute for the rim of a circular saw to travel may be laid down as a rule. For example: A saw 12 inches in diameter, or 3 feet around the rim, 3000 revolutions; 24 inches in diameter, or 6 feet around the rim, 1500; 3 feet in diameter, or 9 feet around the rim, 1000 revolutions; 4 feet in diameter, or 12 feet around the rim, 750 revolutions; 5 feet in diameter, or 15 feet around the rim, 600 revolutions. The rim of the saw will run a little faster than this reckoning, on account of the circumference being more than three times as large as the diameter. Shingle or some other saws, either riveted to a cast-iron collar or very thick at the centre and thin at the rim, may be run with safety at a greater speed."

Useful Items for Office and Shop.

CEMENT FOR WOOD AND IRON.—A foreign journal speaks of a cement made of oxide of lead and concentrated glycerine, which unites wood to iron with remarkable efficiency. The composition is insoluble in acids, is unaffected by the action of heat, sets rapidly, and acquires an extraordinary hardness.

A SOLUTION of four ounces of sandarac, one ounce gum mastic, and four ounces shellac, in one pound of alcohol, to which two ounces oil of turpentine is added, can be recommended as a varnish over stained woods.

POSTAGE-STAMP MUCILAGE.—The following is said to be the formula for the mucilage used on the United States postage stamps: Dextrine, two ounces; acetic acid, one ounce; water, five ounces; alcohol, one ounce. Add the alcohol to the other ingredients when the dextrine is completely dissolved.

VARNISH for indoor painting is made by melting six parts of gum copal and adding two and a half parts of linseed oil. When cold the yield is $6\frac{7}{10}$ parts of concentrated varnish, having the consistence of wax, as the loss on the gum amounts to one and four fifth parts. One part of this concentrated varnish mixed in the cold with one part of oil of turpentine yields two parts of very good varnish for inside work.

STEEL RUST.—According to the *Chemiker Zeitung*, articles of steel which have become rusty may be cleansed by brushing with a paste made up of thirty parts cyanide of potassium, thirty parts curd soap, sixty parts of precipitated chalk, and a sufficiency of water. Our contemporary adds that great care is required in preparing and using this poisonous mixture.

IMITATION MAHOGANY.—Brush over the wood with common ink; when that is dry brush it over with dragon's-blood mixed with methylated spirit in the proportion of one ounce dragon's-blood to one half pint of the methylated spirit. When that is dry, varnish with spirit varnish. Cost of dragon's-blood 3d. per ounce ; methylated spirit 6d. per pint ; varnish 1s. 4d. per pint.

ROSEWOOD.—Boil one half pound of logwood in three pints of water till it is of a very dark red ; add one half ounce of salt of tartar. Stain the work with the liquor while it is boiling hot, giving three coats ; then, with a painter's graining brush, form streaks with the following liquor : Boil one half pound of logwood chips in two quarts of water ; add one ounce pearlash, and apply hot.

SHORTENING A BELT.—It is frequently convenient to shorten a belt temporarily, especially in the upper stories of a mill, when the miller would be put to some trouble and the loss of considerable time to shorten the belt in the customary way. In such cases we have heard the following simple method recommended, which will answer very well where the belt does not run near a beam or other obstruction : Unlace the belt and place the two ends together, making the laced portions parallel, and allowing them to project away from the pulleys. They may then be laced again, using the same holes and fastenings. Though very simple, this hint may save annoyance and time.

VARNISH FOR BASKET WARE.—The following varnish for basket work is said to dry rapidly, to possess sufficient elasticity, and to be applicable with or without admixture of color : Heat 375 grains of good linseed oil on a sand-bath until it becomes stringy, and a drop placed on a cold, inclined surface does not run ; then add gradually 7500 grains of copal oil varnish, or any other copal varnish. As considerable effervescence takes place, a large vessel is necessary. The desired consistency is given to it, when cold, by addition of oil of turpentine.

A CEMENT for such purposes as fixing metal letters to glass windows consists of copal varnish, fifteen parts ; drying oil, five parts ; turpentine, three parts ; oil of turpentine, two parts ; liquefied marine glue, five parts. Melt in a water-bath, and add ten parts dry slaked lime.

CEMENT FOR STEAM JOINTS.—Take salammoniac, two ounces ; sublimed sulphur, one ounce ; fine cast-iron turnings, one pound ; mix in a mortar, and keep dry. When to be used, mix with twenty times its quantity of clean iron turnings or filings, and triturate the whole in a mortar ; then wet with water until of proper consistence. A red putty for steam joints can be made of stiff white-lead worked well in red-lead powder.

VARNISH FOR PAINTINGS.—"Amateur" is informed that a good varnish can be made as follows: Mastic, six ounces ; pure turpentine, one half ounce ; camphor, two drachms ; spirits of turpentine, nineteen ounces ; add first the camphor to the turpentine. The mixture is made in a water-bath, and when the solution is effected, add the mastic and the spirits of turpentine near the end of the operation, then filter through a cotton cloth. The varnish should be laid on very carefully.

WATERPROOF PAPER.—Sheets of stout manilla passed through a hot bath of aqueous solution of zinc chloride (at 75° B.), pressed strongly together and then soaked in dilute aqueous soda solution containing a small amount of glycerine, cohere to form a strong, stiff, waterproof board admirably adapted to the construction of small boats. Single sheets of paper passed quickly through the zinc chloride bath, pressed and washed and dried, are waterproof, and may be otherwise joined to form waterproof boards by any suitable cement.

SCHEDULE OF DAILY WAGES.

(Revised monthly.)

LOCALITIES.	TRADES.						
	Laborer.	Carpenter.	Stair-Builder.	Joiner.	Cabinet-Maker.	Finisher.	Painter.
	$	$	$	$	$	$	$
New York........	1 25 @ 2 25	2 50 @ 2 75	2 25 @ 2 75	2 25 @ 2 50	1 50 @ 3 00	1 50 @ 3 00	1 50 @ 2 00
Boston	1 00 @ 1 50	1 50 @ 2 25	2 00 @ 2 25	1 50 @ 2 00	1 50 @ 2 50	....	1 75 @ 2 25
Baltimore........	1 00 @ 1 60	1 25 @ 2 75	2 25 @ 3 00	2 50 @ 3 25	2 50 @ 3 25	2 00 @ 2 75	1 50 @ 2 50
Philadelphia......	1 10 @ 1 60	1 50 @ 2 25	2 50 @	....	....	....	2 00 @ 2 50
St. Louis	1 00 @ 2 10	1 50 @ 2 00	1.50 @ 3 00	....	....	1 50 @ 2 10	2 00 @ 2 50
Chicago..............	1 00 @ 1 25	1 25 @ 2 00	2 00 @ 3 00	1 75 @ 2 50	1 75 @ 2 50	1 50 @ 2 10	1 75 @ 2 25
Cincinnati..	1 00 @ 1 50	1 75 @ 2 25	1 75 @ 2 50	....	....	....	1 75 @ 2 00
San Francisco...	2 00 @ 3 00	3 00 @ 4 00	....	....	....	....	....
Texas	1 75 @ 2 00	2 50 @ 3 25	....	2 00 @ 3 00	2 00 @ 3 00	....	....
Ottawa (Canada)......	80 @ 1 10	1 25 @ 2 00	1 75 @ 2 50	1 50 @ 2 00	1 50 @ 2 00	1 00 @ 1 75	1 00 @ 1 75
Toronto (Canada)	1 00 @ 1 25	1 25 @ 2 25	2 00 @ 3 00	1 50 @ 2 25	1 50 @ 2 25	1 00 @ 2 00	1 00 @ 2 00